



RESTRICTED

STAT

be worked out every month. This involves a day's work each time. The work schedule chart is not easily understood by the workmen. Since the men of the shifts, who in the course of a month give half time to patrol work /and the other half to maintenance and repairs/, have to cover the same amount of track, they are unable to give equal attention and care to inspection. As a result, track defects are often not noticed and are not remedied.

## 2. Proposed Work Schedule Chart

It is noted that  $3\frac{1}{2}$  [the number of shifts] divides equally into the figure 7. Hence we have ignored the section of the original directive pertaining to the 7-day (weekly) cycle, and modified certain symbols in the work schedule charts accordingly. (See appended Chart No 1.)

When one week (7 days) is taken as one work cycle, after the completion of which the same schedule is followed for the ensuing cycle, there is no necessary relation to the calendar month or calendar year, and thus the labor of making out new work schedules each month is unnecessary.

The labor and materials for the repeated preparation, as well as issue of the work schedules and charts, are thus saved.

The symbols used in the modified chart (Chart No 1) are clear, stand out, and hence easy on the eyes.

The chart is easy to explain to the workmen, and since it is based on a repetitive cycle, they can easily remember it and there is less chance of error in performance of assigned duties.

## 3. Concerning the Half-Patrol Shift

The half-patrol regularly devotes one half of his time (3 working days each week) to patrol work, and one half (3 days) to maintenance work. He does one seventh of the patrol work, and the three men of the other shifts do six sevenths of the patrol work. Thus, the patrol is completely provided for and it is not necessary to change the assignments of the shifts each month.

The proposed scheme is in no sense in conflict with the principles of the ministry's original directive.

## Improvement of the Pai-hao Patrol Method

The ministry's directive states that the number of pai-hao should be the same as the number of work sections. Although the pai-hao for a work section necessarily vary as to on-duty time from month to month, still there is a system in this connection which is to be found embodied in the on-duty schedule. (See footnote appended to Chart No 3 in the Ministry's directive Yang-kung-tzu No 124.)

This method is like the one used in the Te-hsien Division beginning 1 January 1950. But if the number of work sections in the division is not a multiple of three, then the pai-hao lose their cyclic nature or have to revolve in an excessively long cycle, in which event, the execution of the method is attended by the following defects:

1. A new work schedule has to be worked out for each month, involving the waste of one work day each month.

- 2 -

RESTRICTED

RESTRICTED

STAT

2. The system, or methodical manner of arranging the work schedules referred to above, is not comprehended by the workers in the work sections, and does not stimulate their self-confidence or interest.

3. Generally speaking, a division has approximately 20 work sections and the monthly patrol duty schedule has to be arranged for 30 or 31 days. This irregularity causes the personnel serious difficulties.

According to our proposed method, one *pai-hao* is assigned to each work section; but in case the number of work sections is not a multiple of 3, we then add a few *pai-hao*, depending on the amount of track assigned to the responsibility of the section house. In this way the total number of *pai-hao* is made a multiple of 3.

Thereby the two-way patrol can be made cyclic in nature. To illustrate, at Ts'hsien there were 14 work sections; we added four *pai-hao*. Then the work cycle became 6 days. At Ts'ang-hsien, there were 15 work-sections and it was not necessary to add any *pai-hao* because the work cycle was just 5 days. The Ch'in-huang-tao division had 17 work sections on the main line. To get a good work cycle, four *pai-hao* were added and the work cycle became 7 days. This arrangement had the following advantages.

1. The two-way patrol duty schedule could be made out on a short-cycle basis, and it could be used over and over again without rearrangement each month. At Ts'ang-hsien and Ts'hsien, since the work cycle was 5 days and 6 days, respectively, it was still necessary to make out new schedules, whereas at Ch'in-huang-tao, it was not necessary.

2. Upon the completion of a cycle of patrol duty, the same *pai-hao* is again issued for duty at the same hour for the same direction and task, and returned to the same work section where the work can be checked. This arrangement strengthens the patrolmen's confidence and sense of responsibility, and deepens their interest.

3. It is not necessary to work out, print, and issue new work schedules each month. This saves labor and printing materials.

4. The section house has the *pai-hao* which are available at any time for examination and checking by higher level inspectors.

The method works as follows:

The two-way patrol schedule (Chart No 2) takes the work section as the unit, with each work section having a separate page (or sheet of paper). Each section house is responsible for the supervision of several (3-4) work sections. The division is responsible for the direction of the work of each section house.

The method of exchanging *pai-hao* with neighboring work-sections is as follows: Suppose a patrolman starts on duty at the Ch'ang-li work section at 0600 Sunday morning, carrying *Pai-hao* No 12. He proceeds along the "up run" to the meeting point with the Hou-feng-t'ai work-section, reaching there at 0800. There he receives *Pai-hao* No 11, turns around and travels, on the "down run," back to Ch'ang-li, which he reaches at 1000. He leaves *Pai-hao* No 11 at the section house, receives *Pai-hao* No 13 and continues on the down run to the meeting point with the Chang-ke-chuang work section, which he reaches at 1200. Here he gives up *Pai-hao* No 13, and receives *Pai-hao* No 16, reverses his direction, returns on the up run to Ch'ang-li which he reaches at 1400 and gives up *Pai-hao* No 16, and completes the work of his shift, after putting *Pai-hao* No 14 in the hands of the patrolman who follows him on the next shift. The new patrolman then starts on the up run to Hou-feng-t'ai, and so on, as per Chart No 2.

- 3 -

RESTRICTED

RESTRICTED

STAT

A similar procedure is followed at the Lan-hsien work section; and thus at 0600 on the following Sunday morning P'ai-hao No 12 has been returned to the Ch'ang-li Section House, where it is ready to be given to the patrolman to start of the same schedule of duty periods and beats as in the preceding week. Shifts begin and end at 0600, 1400, and 2200, but since the patrol distances of the different work sections are not all even, suitable adjustments are made so that there will be regular times for the patrolmen of adjacent work sections to meet at the section boundaries for the exchange of the p'ai-hao.

#### Experiences in Using P'ai-hao

In the Railway Work Conference of the [Tientsin-P'u-k'ou] Railway at the end of 1949, we received our assigned tasks from the Ministry of Railways, and beginning 1 January 1950, we put into effect the system of responsibility for railway maintenance. At Ts-hsien we began to study the system of patrol responsibility, and used the method of scheduling the two-way patrol system using the p'ai-hao exactly as directed by the ministry. At that time we had 24 work sections and used 24 p'ai-hao, with 8 days forming one cycle. In March 1950, the Te-hsien -- Ts'ang-chow Division was divided. Beginning 21 March, we changed to 14 work sections and 18 p'ai-hao with 6 days forming one cycle.

Following the general railway Conference on Work Schedules held 28 March [1950], we put into effect beginning 1 April the 3½ shift system of scheduling duty periods. Simultaneously, the Ts'ang-hsien Division put into effect the same system we have in use in the Ch'in-huang-tao Division, the system described in this article (see chart 3). Ch'in-huang-tao put this system fully into effect 21 May.

After I was assigned to Ch'in-huang-tao, I undertook a study of the problem of scheduling two-way patrol duty periods using p'ai-hao. Due to the fact that in the Ch'in-huang-tao Division the work section dividing points, unlike those of Te-hsien, did not coincide with the railway stations, at first we experienced great difficulty in preparing the schedules.

Fortunately, a fellow worker, Sun Tung-shan, aided the writer in this task which occupied us for a whole day and night, and it was only at 0200 that we thought of the present method of exchange of p'ai-hao. At that time, there were several nights when we could not sleep because we could not find a workable solution to our problem, due to the fact that prior to 28 March (1950) our upper echelon had not issued detailed instructions as to how to handle the matter. Te-hsien was the first place where this method was put into practice.

[Appended charts follow.]

- 4 -

RESTRICTED

RESTRICTED

STAT

Chart 1. Ch'in-huang-tao Work Division,  
Maintenance Work Section3½ Shift System Patrol Duty Schedule  
(In effect for week commencing --- 1950)

Days	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
Working Periods								
Shift	0600 1400 2200	0600 1400 2200	0600 1400 2200	0600 1400 2200	0600 1400 2200	0600 1400 2200	0600 1400 2200	0600 1400 2200
A Lee	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B Wang	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C Chang	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D Chen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ 8 hr period -- Daylight patrol duty  
☒ 8 hr period -- Half day - half night patrol duty  
☒ 8 hr period -- night patrol duty  
☐ 8 hr period -- daylight maintenance work duty

One week of 7 days is one work cycle; when completed, repeat without changes.

Chart 2. Ch'in-huang-tao Division,  
Patrol Duty Schedule (example)

Day	Hours	Direction	P'ai-hao No
Sun	0000 - 0400	Down	13, 15
	0400 - 0800	Up	12, 14
	0800 - 1200	Down	11, 13
	1200 - 1600	Up	14, 16
	1600 - 2000	Down	9, 11
	2000 - 2400	Up	16, 18
Mon	0000 - 0400	Down	7, 9
	0400 - 0800	Up	18, 20
	0800 - 1200	Down	5, 7
	1200 - 1600	Up	20, 21
	1600 - 2000	Down	3, 5
	2000 - 2400	Up	21, 19
Etc	0000 - 0400	Down	

Ch'ang-li Road Maintenance Section

- 5 -

RESTRICTED

RESTRICTED

STAT

Chart 3. Ch'in-huang-tao Division  
Patrol Duty Schedule Planning Chart (Example)

Section house		Lan-hsien Section House					
Work section		Ku-yeh No 1	Pei-chia- tien	Leichuang	T'o-tzu- t'ou	Lanhsien	Lan-hsien Foreman
P'ai-hao		1	2	3	4	5	6
Days	Hours						
Sun	0600						
	1400						
	2200						
Mon	0600						
	1400						
	2200						
Tue	0600						
	1400						
	2200						
Wed	0600						
	1400						
	2200						
Thur	0600						
	1400						
	2200						
Fri	0600						
	1400						
	2200						
Sat	0600						
	1400						
	2200						
Sun	0600						
	1400						

(This is only one part of the work plan schedule; each section house has a similar schedule.)

- E N D -

- 6 -

RESTRICTED